Advanced Ceramics Laboratory 1

EMA 4041L Section 041L
Class Periods: M/Periods 5-6 (11:45am -1:40pm)
Location: TBD
Academic Term: Spring 2024

Instructor:
Name: Dr. Jack Mecholsky
Office Location: 206 Rhines Hall
Email address: jmech@mse.ufl.edu
Office Phone Number: 352-846-3306
Office Hours: TBD

Teaching Assistant/Peer Mentor/Supervised Teaching Student:
Please contact through the Canvas website

- Name: TBD
- email address: TBD
- office location: TBD
- office hours: TBD

Course Description
Forming, drying, firing and testing of traditional ceramic materials. (1 Credit)

Course Pre-Requisites / Co-Requisites
Corequisite EMA 4645

Course Objectives
At the end of this course students will be able to understand and apply the basic principles of ceramic processing, including characterization techniques, colloid and surface science, particle mechanics, ceramic forming and drying.

Materials and Supply Fees
$80

Relation to Program Outcomes (ABET):
The table below is an example. Please consult with your department's ABET coordinator when filling this out.

Outcome	Coverage*
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	Medium
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors	High
3. An ability to communicate effectively with a range of audiences	
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts	Medium
5. An ability to function effectively on a team whose members together provide leadership, create a	

collaborative and inclusive environment, establish goals, plan tasks, and meet objectives	
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	Medium

*Coverage is given as high, medium, or low. An empty box indicates that this outcome is not covered or assessed in the course.

Required Textbooks and Software

NONE

- Title
- Author
- Publication date and edition
- ISBN number

(if course notes derived from various published sources are used, provide information above for each source)
(if course notes are developed by the instructor, so state)

Recommended Materials

Recommended Reading: Title – Ceramic Processing, by M.N. Rahaman, CRC, Taylor and Francis, 2007. ISBN 0-8493-7285-2

Course Schedule

EMA 4041L -Advanced Ceramics Laboratory 1; Mondays, 11:40 am to 1:40 pm (Periods 5&6)

Lab schedule (subject to change)

System: Alumina (or selected by the module instructor).

Duration, Weeks	**Module**	**Instructor**	**Content/Outcomes (tentative)**
Monday, January 8	Safety lecture, Lab orientation	Safety lecture* – Gilley Lab orientation - Moudgil	Hazard assessment, SOPs, lab topics orientation
Monday, January 15	MLK Holiday, - NO CLASS		
Week of January 22	Glass Fabrication	Mecholsky Lecture* +lab	Viscosity, Glass Transition
Monday, January 29	Glass Fabrication II	Mecholsky Lab	Optical Properties
Monday, February 5	Glass Fabrication III	Mecholsky Lab	Heat Treatments
Monday, February 12	Characterization I	Lecture/Lab	Electrical Measurements
Monday, February 19	Characterization II	Lab	Optical Measurements Photoelasticity
Monday, February 26	Characterization III	Lecture/Lab	Hardness
Monday, March 4	Sputter coating	Scheiffele Lecture*+ lab	Basics of sputter coating

Monday, March 11	Spring Break - NO CLASS		
Monday, March 18	Sputter coating & characterization	Scheiffele lab	Sputter coating characterization,
Monday, March 25	Characterization	Scheiffele lab	Sputter coating characterization, thickness, microstructure, composition
Monday, April 1	Mechanical Properties (Fracture/Failure Analysis)	Mecholsky Lecture* +lab	Measurement of mechanical properties; fracture &failure analysis
Monday, April 8	Mechanical Properties (Fracture/Failure Analysis)	Mecholsky lab	Measurement of mechanical properties; fracture &failure analysis
Monday, April 15	Mechanical Properties (Fracture/Failure Analysis)	Mecholsky lab	Measurement of mechanical properties; fracture &failure analysis
Monday, April 22	Review	Mecholsky	Q&A

Students are expected to dress properly for laboratory class. Closed toed shoes are required for class. Pants are preferred. There is no food or drink of any kind in the laboratory. Students are required to complete all modules in addition to the safety module. Each module has skills criteria that have to be met for successful completion of the module.

Each Topic listed above may have a student product which will be graded as a formal assessment. There will be a rubric for each product. Student products may include, but are not limited to; lab reports, Hazard Assessments, SOPs, users manuals, program codes, oral presentations.

Attendance Policy, Class Expectations, and Make-Up Policy

Attendance is strongly suggested since significant amount of participation, as well as individual and collaborative work will be performed during the class sessions and will be worth as much as 20% of the course points. Students are expected to comply with all laboratory guidelines, protocols, and procedures. Students who do not comply with these requirements or who behave disorderly or disrespectfully will be asked to leave. Leaving your cell phone on, leaving early or arriving late can be VERY distracting, you should avoid it. All electronic devices (laptops, cell-phones, etc.) should be turned off or in silent mode. If your cellphone rings during class it will be confiscated for the remainder of the class period. Use of smartphones, laptops, tablets or similar personal computers is not allowed unless explicitly requested by the individual student the first day of class and for note taking purposes only. No audio/video recording is allowed without express permission of lecturer.
Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies. Click here to read the university attendance policies:
https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/

Evaluation of Grades

Assignment	Total Points	Percentage of Final Grade
Students daily notebooks	100 each	15%
Student Hazards assessments, experimental outlines, SOPS	100 each	50%
Student Skills criteria and outcomes for each module	100	25%
Student characterization and analysis of products/results from modules	100	10%
		100%

Grading Policy

The following is given as an example only.

Percent	Grade	Grade Points
93.4 - 100	A	4.00
90.0 - 93.3	A-	3.67
86.7 - 89.9	B+	3.33
83.4 - 86.6	B	3.00
80.0 - 83.3	B-	2.67
76.7 - 79.9	C+	2.33
73.4 - 76.6	C	2.00
70.0 - 73.3	C-	1.67
66.7 - 69.9	D+	1.33
63.4 - 66.6	D	1.00
60.0 - 63.3	D-	0.67
0 - 59.9	E	0.00

More information on UF grading policy may be found at:
https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

Students Requiring Accommodations

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting https://disability.ufl.edu/students/get-started/. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

Course Evaluation

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

In-Class Recording

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A "class lecture" is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To "publish" means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

University Honesty Policy

UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Conduct Code (https://sccr.dso.ufl.edu/process/student-conduct-code/) specifies a number of behaviors that are in violation of this code and the possible sanctions. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Commitment to a Safe and Inclusive Learning Environment

The Herbert Wertheim College of Engineering values broad diversity within our community and is committed to individual and group empowerment, inclusion, and the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture.

If you feel like your performance in class is being impacted by discrimination or harassment of any kind, please contact your instructor or any of the following:

- Your academic advisor or Graduate Program Coordinator
- Jennifer Nappo, Director of Human Resources, 352-392-0904, jpennacc@ufl.edu
- Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, taylor@eng.ufl.edu
- Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, nishida@eng.ufl.edu

Software Use

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Student Privacy

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: https://registrar.ufl.edu/ferpa.html

Campus Resources:

Health and Wellness

U Matter, We Care:
Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

Counseling and Wellness Center: https://counseling.ufl.edu, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Discrimination, Harassment, Assault, or Violence
If you or a friend has been subjected to sexual discrimination, sexual harassment, sexual assault, or violence contact the **Office of Title IX Compliance**, located at Yon Hall Room 427, 1908 Stadium Road, (352) 273-1094, title-ix@ufl.edu

Sexual Assault Recovery Services (SARS)
Student Health Care Center, 392-1161.

University Police Department at 392-1111 (or 9-1-1 for emergencies), or http://www.police.ufl.edu/.

Academic Resources

E-learning technical suppor*t*, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu. https://lss.at.ufl.edu/help.shtml.

Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling; https://career.ufl.edu.

Library Support, http://cms.uflib.ufl.edu/ask. Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring. https://teachingcenter.ufl.edu/.

Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers. https://writing.ufl.edu/writing-studio/.

Student Complaints Campus*:* https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/;https://care.dso.ufl.edu.

On-Line Students Complaints*:* http://www.distance.ufl.edu/student-complaint-process.